

What is claimed is:

1. A routing and switching apparatus comprising:
a switching fabric;
a matrix of switching and routing elements, at least some of said elements being interconnected by said switching fabric; and
router control providing control for said switching fabric,
wherein said apparatus has both cross-connect and routing functionality.
2. The apparatus as claimed in claim 1 wherein said apparatus can support GMPLS.
3. The apparatus as claimed in claim 1 wherein said apparatus further comprises an IP-based layer-3 virtual router.
4. The apparatus as claimed in claim 2 wherein said apparatus can provide layer-3 VPN services.
5. The apparatus as claimed in claim 2 wherein said apparatus can perform layer-3 forwarding via a network processor.
6. The apparatus as claimed in claim 4 wherein said apparatus can exist both physically and virtually with in a particular network.
7. The apparatus as claimed in claim 4 further comprising a router capable of forwarding packets according to a label switching algorithm.
8. A fabric card for use in a routing and switching apparatus, the fabric card comprising:
a circuit board;
a switching fabric; and
a matrix of switching and routing elements attached to said circuit board,

wherein at least some of said elements are interconnected by said switching fabric.

9. The fabric card as claimed in claim 8 further comprising a fabric control processor attached to said circuit board.
10. The fabric card as claimed in claim 9 wherein a CLOS architecture is employed.
11. The fabric card as claimed in claim 9 wherein said fabric control processor programs a number of connections within said card.
12. The fabric card as claimed in claim 11 wherein said fabric card is compatible with STS-48.
13. A method for operating a router comprising the steps of:
using a primary router to direct an electrical signal to a virtual router; and
using said virtual router to perform virtual router functions, wherein
said virtual router runs GMPLS.
14. The method as claimed in claim 13 further comprising the step of using said primary router to direct said electrical signal from said virtual router.
15. The method as claimed in claim 14 wherein said primary router controls a subset of a switching fabric.
16. The method as claimed in claim 15 wherein said virtual router controls another subset of said switching fabric.
17. The method as claimed in claim 16 wherein said virtual router supports a combination of at least two of layer-2 switching Ethernet, layer-2 switching MPLS, and layer-3 forwarding via a network processor.

18. The method as claimed in claim 17 wherein said virtual router is embedded in a label switch router.
19. The method as claimed in claim 18 wherein said primary router runs GMPLS.
20. The method as claimed in claim 19 wherein said electrical signal is STS-48.